Abstract Submitted
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Relaxation dynamics of photoexcited carriers in graphene probed by optical pump-THz probe spectroscopy LIANG ZHAO, Case Western Reserve University, KIN FAI MAK, NICK PETRONE, JIM HONE, TONY HEINZ, Columbia University, JIE SHAN, Case Western Reserve University — The relaxation of hot carriers in graphene is a subject of much current interest. The role of electronic and phonon relaxation channels is a topic of particular focus, with phenomena such as carrier multiplication, in which multiple charge carriers are generated from absorption of a single photon, having been predicted.[1] In this work, we apply the optical pump-THz probe spectroscopy to investigate the relaxation dynamics of photoexcited carriers in large-area single-layer graphene samples grown by chemical vapor deposition (CVD). The complex optical conductivity induced by optical excitation is determined over a broad range of THz frequencies as a function of the pump-probe delay time. To probe carrier relaxation dynamics, we compare the transient optical conductivity to a single-particle model for the intraband response. The effect of pump fluence and the static doping density on the carrier dynamics will be discussed.

[1]T. Winzer, A. Knorr, and E. Malic, Nano Letts. 10, 4839 (2010).

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